

Solve for x

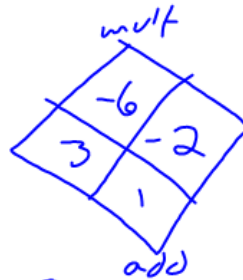
①  $x^2 = -x + 6$

$$\begin{array}{r} +x \quad +x \\ x^2 + x = 6 \\ -6 \quad -6 \end{array}$$

$x^2 + x - 6 = 0$

$(x+3)(x-2) = 0$

$x = -3, 2$



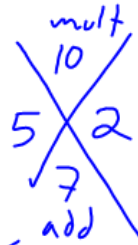
③  $x^2 = -7x - 10$

$$\begin{array}{r} +7x \quad +10 \\ x^2 + 7x + 10 = 0 \end{array}$$

$x^2 + 7x + 10 = 0$

$(x+5)(x+2) = 0$

$x = -5, -2$



②  $x^2 = 5x + 14$

$$\begin{array}{r} -5x \quad -14 \\ x^2 - 5x = 14 \\ -14 \quad -14 \end{array}$$

$x^2 - 5x = 14$

$-14 \quad -14$

$x^2 - 5x - 14 = 0$

$(x-7)(x+2) = 0$

$x = 7, -2$



④  $2x^2 + x = 3$

$$\begin{array}{r} -3 \quad -3 \\ 2x^2 + x - 3 = 0 \end{array}$$

$2x^2 + x - 3 = 0$

$(2x+3)(x-1) = 0$

$x = 1, -1.5$

$2x+3=0$

$$\begin{array}{r} -3 \quad -3 \\ 2x = -3 \\ \frac{2x}{2} = \frac{-3}{2} \\ x = -1.5 \end{array}$$

$$3x^2 - 2 = 5x$$

$$-5x - 5x$$

$$3x^2 - 5x - 2 = 0$$

1-3 → 1-2

$$(3x + 1)(x - 2) = 0$$

$$x = 2, -\frac{1}{3}$$

$$3x + 1 = 0$$

$$-1 \quad -1$$

$$3x = -1$$

$$x = -\frac{1}{3}$$

100

$$(\sqrt{8} - \sqrt{7})^2$$

$$(\sqrt{8} - \sqrt{7})(\sqrt{8} - \sqrt{7})$$

$$\underline{8} - \underline{\sqrt{56}} - \underline{\sqrt{56}} + \underline{7}$$

$$15 - 2\sqrt{56}$$

$$\downarrow$$

$$\sqrt{4} \cdot \sqrt{14}$$

$$15 - 2 \cdot 2\sqrt{14}$$

$$\boxed{15 - 4\sqrt{14}}$$

(106)

$$\frac{(2+\sqrt{10})}{2-3\sqrt{5}} \cdot \frac{(2+3\sqrt{5})}{2+3\sqrt{5}}$$

$$(2+\sqrt{10})(2+3\sqrt{5})$$

$$6\sqrt{5} + 4 + 2\sqrt{10} + 3\sqrt{50}$$

$$3 \cdot \sqrt{2} \cdot \sqrt{25}$$

$$3 \cdot 5 \cdot \sqrt{2}$$

$$15\sqrt{2}$$

top

$$4 + 6\sqrt{5} + 2\sqrt{10} + 15\sqrt{2}$$

$$(2-3\sqrt{5})(2+3\sqrt{5})$$

$$4 + \cancel{6\sqrt{5}} - \cancel{6\sqrt{5}} - 9\sqrt{25}$$

$$-9 \cdot 5$$

$$-45$$

$$\boxed{-41}$$

bottom

# Radical Equations - variable inside the radical (root)

Radical Equation

$$3 + \sqrt{x} = 10$$

Solve by undoing

$$\begin{array}{r} 3 + \sqrt{x} = 10 \\ -3 \quad -3 \end{array}$$

$$\begin{array}{r} (\sqrt{x})^2 = (7)^2 \\ \boxed{x = 49} \end{array}$$

Not a radical Equation

$$\sqrt{3} + x = 10$$

$$\begin{array}{r} 2 + \sqrt{3x-2} = 6 \\ -2 \quad -2 \end{array}$$

$$(\sqrt{3x-2})^2 = (4)^2$$

$$\begin{array}{r} 3x-2 = 16 \\ +2 \quad +2 \end{array}$$

$$3x = 18$$

$$\boxed{x = 6}$$

$$\frac{2}{2} (x-2)^{2/3} = \frac{50}{2}$$

$$(x-2)^{2/3} = 25$$

$$\longrightarrow \left( (x-2)^{2/3} \right)^{3/2} = (25)^{3/2}$$

$$\left( \sqrt[3]{x-2} \right)^{\cancel{2}} = 25^{\sqrt{\phantom{x}}}$$

$$x-2 = 25^{3/2}$$

$$= (\sqrt{25})^3$$

$$= (\pm 5)^3$$

$$= 125$$

$$-125$$

$$\left( \sqrt[3]{x-2} \right)^3 = (\pm 5)^3$$

$$x-2 = 125$$

$$\begin{array}{r} +2 \quad -125 \\ \hline \end{array}$$

$$\boxed{\begin{array}{r} x = 127 \\ \text{or} \\ -123 \end{array}}$$

$$\frac{2(x+3)^{3/2}}{2} = \frac{54}{2}$$

$$(x+3)^{3/2} = 27$$

$$(\sqrt{x+3})^3 = 27$$

$$\sqrt[3]{\phantom{x+3}} \quad \sqrt[3]{\phantom{x+3}}$$

$$(\sqrt{x+3})^2 = (3)^2$$

$$\begin{array}{r} x+3=9 \\ -3 \quad -3 \end{array}$$

$$\boxed{x=6}$$

sect. 7.5

#1-12